

# JUNKERS Ju 86

Joachim Dressel & Manfred Griehl







*Readying a Ju 87 D for an SC 1000 bomb*



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Joachim Dressel and Manfred Griehl



*Prototype for testing the new Jumo 205 engine configuration*

**Credits:**

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Griehl



*By 1937 twelve Gruppen, each outfitted with 36 Ju 86 E and D, were available to the Luftwaffe.*

*Title Photo: Closeup of the Ju 86's nose turret.*

Translated from the German by Don Cox

Front cover artwork by Steve Ferguson

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## Junkers Ju 86 In Worldwide Service

The developmental guidelines for the future German Luftwaffe's "medium bomber" had already been worked out and sent to the majority of aircraft manufacturing companies by 1932.

During the course of the German Luftwaffe buildup the command staff issued a requirement for a medium bomber in early 1934 which would be capable of a 450 km penetrating range with a 1,000 kg bomb load. The main criterion was speed and bomb load, while armament and range took a back seat. For long range strategic missions the requirement was issued at about the same time for the "Ural Bomber". Eventually the choice narrowed down to the Ju 86 in addition to the He 111 and Do 17. All three prototypes were incorporated into the "Rhineland Program" in 1935 and cleared for either pre-production or full scale production. In doing so, the requirement for large numbers of capable level bombers

required by the RLM would be met, while at the same time offsetting the expected losses due to converting aircraft works over to license production and copies.

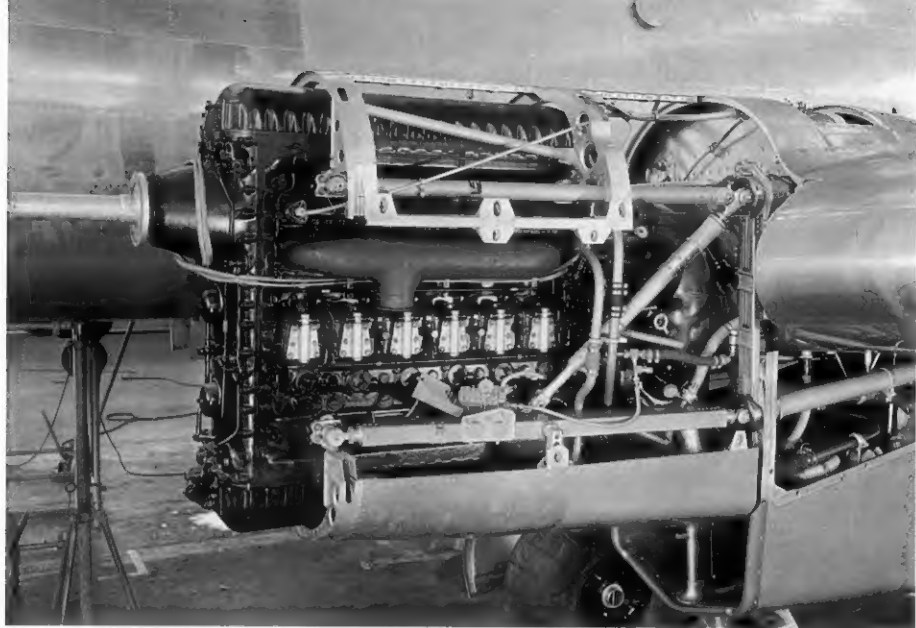
In the spring of 1934 the Junkers firm was given a contract for building five Ju 86 prototypes—alternating military and civilian versions. Within five months the Junkers works had designed and built the first Ju 86a prototype, later designated the V 1, under the direction of Ernst Zindel (director of the design bureau) and his representative, Dipl.-Ing. Hermann Pohlmann. On 4 November 1934 this machine completed its maiden flight in Dessau powered by two Siemens SAM 22 engines, since the planned Jumo 205 diesel motors were not yet available. By March of 1936 all five of the first prototypes had flown. As with the Do 17 and the He 111, the first prototypes were simultaneously planned for testing as both bomber and civilian airliner:

V prototype	Werknr.	Maiden flight	Registration	Role
Ju 86 V 1	4901	11/04/1934	D-AHEH	medium bomber
Ju 86 V 2	4902	03/22/1934	D-ABUK	DLH airliner
Ju 86 V 3	4903	06/16/1935	D-ALAL	medium bomber
Ju 86 V 4	4904	08/24/1935	D-AREV	DLH airliner
Ju 86 V 5	6001	03/07/1936	D-AHOE	medium bomber(A-0)

*The first prototype of the Ju 86 V 1 (WerkNr. 4901) with incomplete markings.*







*Above: The Jumo 205 diesel engine was the trademark of the Ju 86 for a long time.*



*Left: Production of the A-Stand (nose turret) armed with an MG 15, later to be fitted to the Ju 86 A-1 and subsequent versions.*



*Above: Wing of an early Ju 86 being built in the main Dessau plant.*



*Right: Looking into the wing after removal of access panels for the fuel and lubricant tanks.*

## Military Versions of the Ju 86

In April 1934 a full-scale mockup of the Ju 86 was built and subsequently evaluated by the RLM, who gave their general approval of the design. This was followed by the construction of the first prototype.

After a relatively short factory evaluation period the Ju 86—with its original fixed landing gear—and its He 111 competitor arrived at the Luftwaffe's test facility in Rechlin in July of 1935. The first test flights of the initially unarmed Ju 86 V 1 revealed several problems, primarily due to its sluggish control handling. In addition, like the He 111 the Ju 86's wings had a tendency to stall when the aircraft was put into a stalled position; this was due to both too sharp a taper to the wings as well as their trapezoidal design. The reason for this error—which was also common in other countries—was caused by a false assumption regarding the distribution of lift along a trapezoidal wing and an elliptical wing design with too sharp a taper in its outer section. By employing more thorough aerodynamic research, the designers succeeded in avoiding the premature separation of the airflow near the outer wing sections and subsequent wing stalling by using a "kinked" trapezoid design. Prototype testing of the Ju 86 V 1 concluded in October of 1935.

By making changes to the first prototype example, this version also saw the fitting of a semi-exposed dorsal gunner's position (B-Stand) and a retractable ventral gunner's position (C-Stand, sometimes called a "dustbin"). From 6 January on this aircraft served as a testbed for evaluating two Jumo 206 engines.

The second military prototype was the Ju 86 V 3, which had a glazed nose with a traversible MG 15 machine gun in the nose gunner's position. The machine was fitted out with two Hornet 350 engines and its factory testing got underway in the summer of 1936. In Rechlin, testing with the FuG III had begun by September. In November 1936 the aircraft was sent back to Junkers for repairs since cracks had begun appearing along the wings between the rivets. The aircraft was subsequently used for a time at Junkers to test tail control surfaces, but was eventually sent back to Rechlin. The prototype had the standard nose gunner's position of the Ju 86 V 3. After 233 flying hours the aircraft crashed due to unknown causes.

In March of 1936 the third military prototype, Ju 86 V 5, had already taken to the skies. This example was both the first of the seven pre-production aircraft series and also the first prototype for the A-1 large-scale production batch. It was powered by two Jumo 205 diesel engines.



Left: Prototype nose gun position armed with an MG 15 in a Vela vertical mount from Junkers (gun carried 1050 rounds in 14 drums).



The mockup built in July 1936 was based on this aircraft, which was used as the prototype example for the A-series following prototype testing in Rechlin (December 1935 to July 1936).

At the end of 1935 Junkers began construction on the pre-production series (V 5 through V 11), of which Werknr. 6002 flew as the Ju 86 V 6. On 18 March 1936 the Ju 86 V 6 (registration D-ANAY) completed its maiden flight. In order to improve stability, the Ju 86 V 6 (A-0) was fitted with a keel-like extension of 42 cm which extended out beyond the fuselage end cap. In addition the aircraft served as a testbed for engine and landing gear trials in Rechlin. The V 6 was forced to make an emergency landing on 22 January 1936 due to an engine fire caused by a broken piston rod in the starboard engine, which kept it out of commission until the beginning of September.

The next prototype was a "command aircraft". This variant, designated the Ju 86 V 7 (A-0), was fitted with an enhanced radio communications system and crewed by extra personnel in order to control large formations of bombers. The Ju 86 V 8 (Werknr. 6004), D-AVEE) was pulled from the A-0 pre-production series and sent to Rechlin in May of 1936 for endurance testing. Prior to this tests were carried out with VDM oleo-pneumatic struts. The Ju 86 V 8 (A-0) was written off during its testing phase on 16 May 1936.

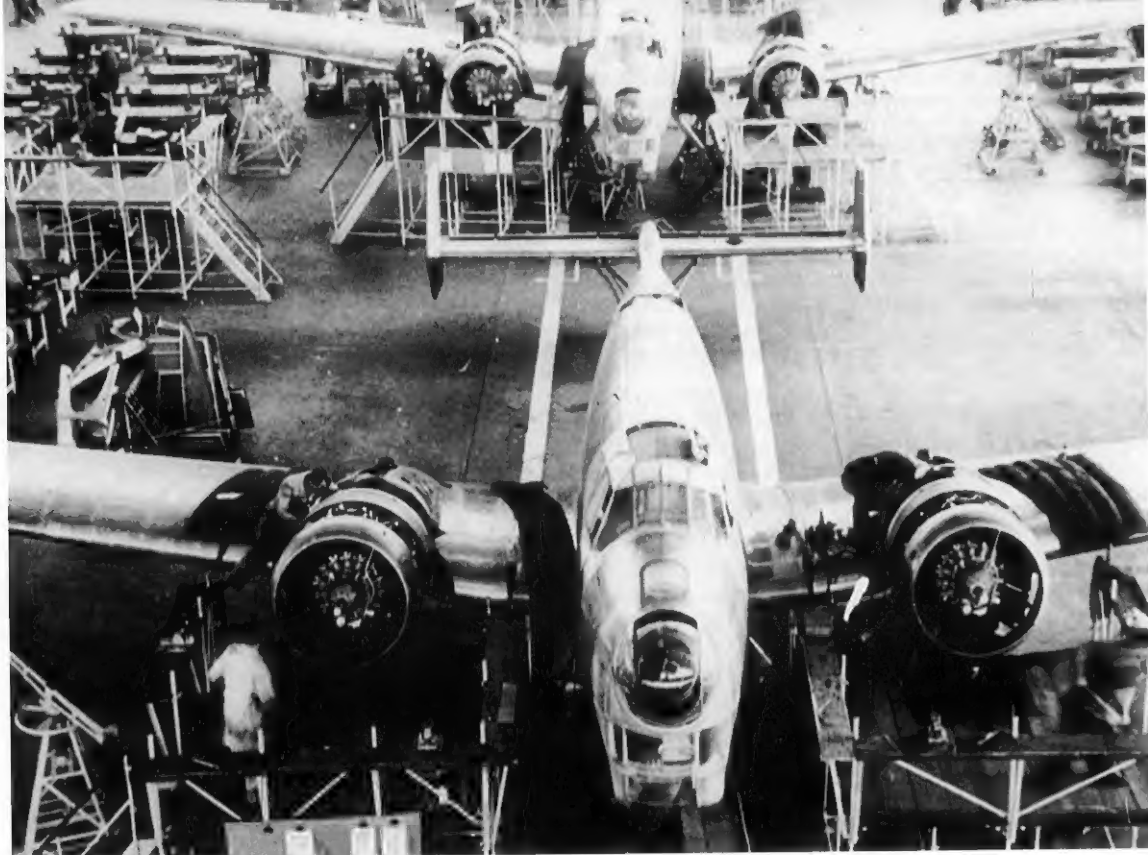
Ju 86 V 9 (Werknr. 6003) was an A-0 aircraft, designed as a "specialized photography aircraft" with Jumo 205 C engines. Planning for this aircraft had begun as early as 1935. Junkers was able to finish the prototype in December, and by summer 1936 the aircraft was operating out of Staaken near Berlin with the Hansa Luftbild company.

The next example was the V 10 (Werknr. 6006), powered by two Jumo 205 C engines and for a time serving as a test platform for an autopilot system. Ju 86 V 11 (Werknr. 6007) was an improved prototype for the upcoming A-1 series and was built on the experience gained with the Ju 86 V 5. Testing began around the end of 1936.

In the spring of 1936 deliveries began of the Ju 86 A-1 series models. A few weeks later the first aircraft were delivered to KG 152 "Hindenburg". Despite an improved wing design the stability along the horizontal axis was still felt to be unsatisfactory. Four machines from the A-1 batch were to undergo thorough testing. The first of these was Ju 86 V 12 (Werknr. 0055), which was fitted with two BMW 132 F (later BMW 132 FD) radial engines. Testing of this prototype began in October of 1936 in Rechlin. The prototype was followed by Ju 86 V 13 (Werknr. 0052), which served as the forerunner for a production version with the BMW 132 F. The same applied to the V 14, testing of which was completed in May of 1937. The fourth A-1 prototype was Werknr. 0099, which was a test plane for the Jumo 207 C engines and was cleared for flight testing around the end of 1936.

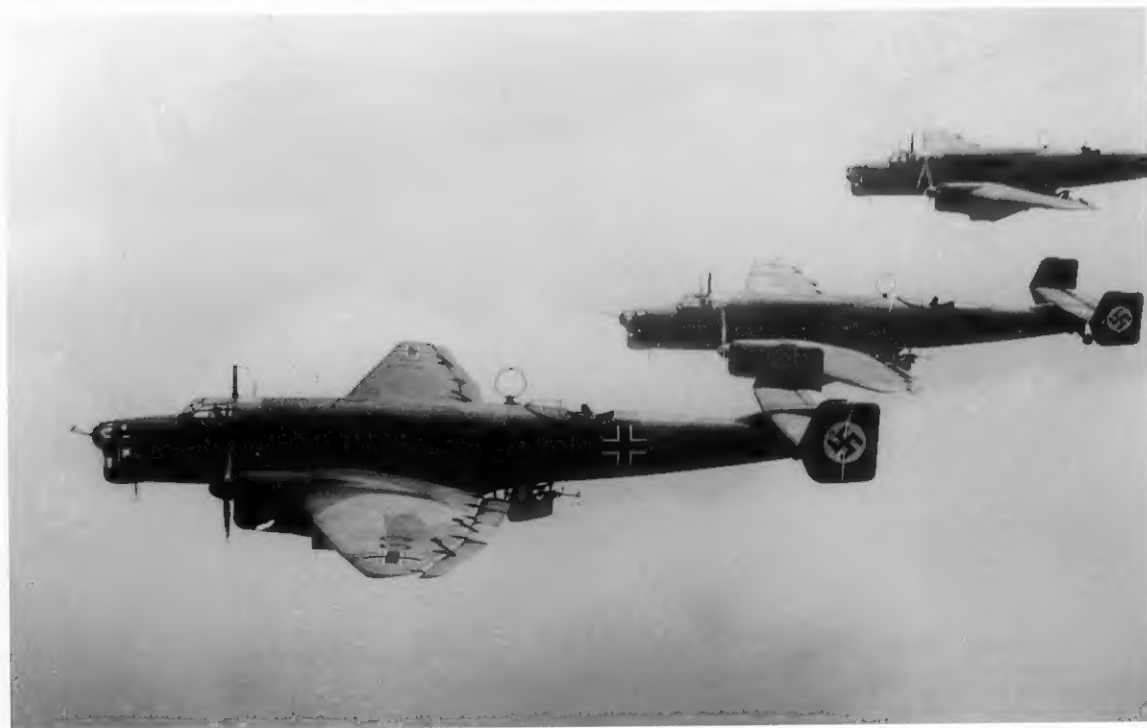
*Production design of the nose gunner's position in a Ju 86 D-1 with its installed bombsight.*





*Above: Ju 86 series production in the Dessau works.*

*Below: Three Ju 86s of KG 253 in early 1937 flying above the overcast.*



Due to pressure from the Luftwaffe's leadership the aircraft was approved for purchase quite early, on 21 January 1935. The date was well in advance of the requisite final evaluation report for the Ju 86 V 1 through V 5. Since it was expected that the He 111 would provide greater development opportunities, this design was put into large-scale production, while more and more the Ju 86 was seen as little more than a stopgap solution.

Regarding this matter, in 1979 Ernst Zindel had this to say: "A difficult handicap for the Ju 86 in comparison with the He 111 was the less powerful engines - with the first prototypes, when the He 111 still had the BMW VI engines, the difference in speed was not that great. But the eventual powerplant for the He 111 was the Jumo 211, which had proven to be quite successful during its prototype testing, and with this engine the He 111 was far superior to the Ju 86 with its Jumo 205; a corresponding boost in power for the Jumo 205 diesels could not be made, particularly before the design entered full-scale production. I am unaware whether or not the Luftwaffe ran into additional difficulties with what was for them a completely new diesel two-stroke engine. In any case the RLM/Luftwaffe had no choice but to eventually decide in favor of series production for the He 111 which, in view of the intended 70% more powerful Jumo 211, was designed from the outset to be somewhat larger than the Ju 86."

"Nevertheless, Koppenberg (general director of the Junkers Werke) had pushed for what actually was a premature production run of the Ju 86. In spite of this, only a small number of those machines going to the Luftwaffe were delivered with the Jumo 205 diesel engine, the majority of the nearly 600 machines built in

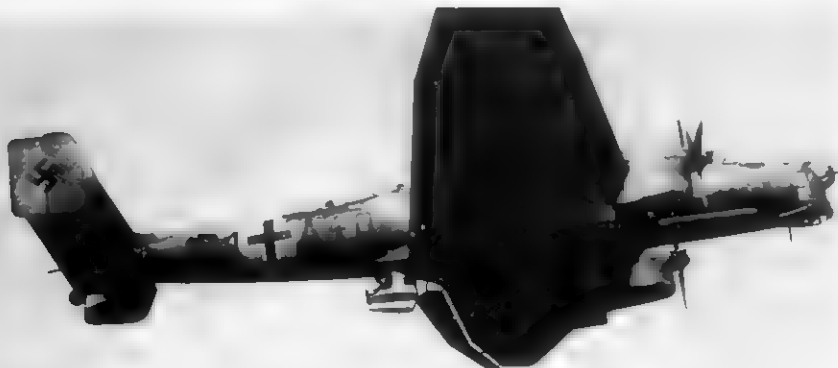
Germany were powered by two nine-cylinder 132 F radial engines from BMW, each having an output of 800 hp (589 kW), and these were delivered to the Luftwaffe. Then production for the German Luftwaffe came to a halt, while the He 111 was put into full-scale production. Those license companies which had been scheduled to produce the Ju 86 had to switch over to the He 111, and even the production works of Junkers was forced to license-build a small batch of 42 He 111s, quite a bitter pill for the Junkers Werke and the ambitious Generaldirektor Koppenberg to swallow. He ranted and raved and blamed us, the design bureau. Those were bad times for us!"

"To be sure, Kloppenberg succeeded in limiting the He 111 production at Junkers to the insignificant and, naturally with regard to all the work preparation and time requirements, completely uneconomical and senseless number of 42 aircraft, but the "shame" and "loss of prestige" for the Junkers firm, mainly the design bureau, was of course great."

In addition to the previously mentioned evaluation prototypes, numerous other Reich-owned aircraft were provided carte blanche to the German aviation industry for testing purposes - as outlined in newsletter No. 201 of the Reichsverband der deutschen Flughäfen e.V. (1 April 1937). These included:

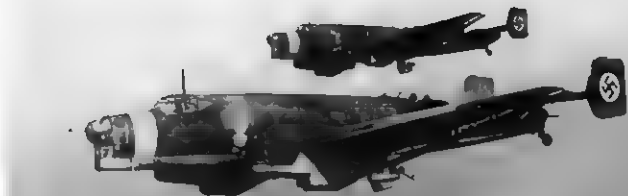
Registered User	Type	Registration
Junkers GmbH, Dessau	Ju 86	D-AFWA
plus from 3 September 1938		
Anschütz & Co., Kiel Neumühlen	Ju 86	D-AEMU
Askania Werke AG, Berlin Friedenau	Ju 86	D-AIBO
Junkers Motorenbau GmbH, Dessau	Ju 86	D-AQOU

The retractable belly turret shows up well on this Ju 86 A-1 (21+A40)





*Left: Ju 86 A-1s from KG 253 in 1936 during a formation flying exercise.*



*Above: Navigational flight training of an operational aircraft from the later KG 1 "Hindenburg" bomber wing.*



*Left: Bombsight in the forward nose section of a Luftwaffe Ju 86 D-1*

The changes to the Ju 86 V 6 and increased capacity fuel tanks resulted in the Ju 86 D-1 variant in the autumn of 1936. In October of that year the Ju 86 A-1 and Ju 86 D-1 were unveiled to the public in Bückeburg. In addition to the performance problems of the Jumo 205 already mentioned, in the meantime there had already been some rethinking regarding the use of diesel engines in combat aircraft. These engines tended to respond slowly to changes in performance, a particularly disadvantageous feature during formation flying or when performing critical tactical maneuvers. These impressions were quickly confirmed in the Spanish Civil War at the end of 1937 when the Ju 86 D-0 was deployed. The Jumo 205 diesel engines rapidly overheated and pistons were destroyed during radical changes in engine rpms, when unavoidable demands were placed on the engines during hard maneuvers. Several weld spots also began showing signs of stress, leading to an inordinate amount of engine failures. As a result, a Ju 86 D-1 was fitted with the BMW 132 F radial engine, an American Pratt & Whitney fuel-injected engine license built by BMW. In the spring of 1937 this aircraft, designated Ju 86 V 9, was given a thorough evaluation in Rechlin. After it was approved, in late summer 1937 the Luftwaffe began receiving the Ju 86 E-1, the variant fitted with the 596 kW (819 hp) BMW 132 F engine. The more powerful BMW 132 N (636 kW output) became available once 30 of the aircraft had been completed. Those Ju 86s fitted with this engine were later designated E-2.

In May of 1936 flight testing began in Rechlin with the Ju 86 V 10 (Werknr 6006), a machine pulled from the A-0 production series and fitted with a modified forward fuselage. The pilot's view during takeoff was improved by moving the pilot compartment forward and fitting the airplane with a fully glazed and somewhat more compact canopy. With these changes the Ju 86 G-1 variant began leaving the production hangars in Dessau starting in the spring of 1938. After only 40 Ju 86 G-1s had been built, however, production of the Ju 86 was once again brought to a halt in the early summer of 1938. On 19 September 1938 the highest number of Ju 86s was in service with the German Luftwaffe.

Model	# in inventory	# operational
Ju 86 A/D	159	136
Ju 86 E	43	35
Ju 86 G	33	29

In comparison with the above figures, there were significantly greater numbers of the other level bombers, the Do 17 and He 111, serving with the Luftwaffe.

Model	# in inventory	# operational
Do 17 E	328	271
Do 17 M	102	80
He 111 B	272	219
He 111 E	171	141
He 111 F	39	30
He 111 J	88	78

At this time the Luftwaffe had—in offensive strength—2,188 front-line aircraft, of which 1,825 were operationally ready.



Unknown student crew in the autumn of 1940



*Above. During training operations many accidents occurred because of operator error*

*Below. A Ju 86 E being used as a training platform. Notice the small windows in the fuselage center section.*







*Above: This Ju 86 was on its way to one of the Main-Frankish bombing ranges in the early summer of 1938*

*Below: Taking the oath at the Lechfeld airbase (now a German Army post)*





*Above. Formation flight training with KG 253*

*Below: Machines from KG153 during a flight over the Alps.*



*Right: A Ju 86 D-1 in Spain, the aircraft in the background is a Northrop 1D Delta.*



*Below: A crash-landed Ju 86 D-1 from the Versuchsbomberabteilung VB/88 of the Condor Legion during the Spanish Civil War.*



*Right: The first Ju 86 D-1 arrived in Spain in the summer of 1937 and flew with VB/88*





*Above: The Ju 86 D proved to be markedly inferior to the He 111 B-1 and B-2 during the Spanish Civil War.*

*Below: This landing gear damage is being repaired at the Leon airfield. The aircraft in the background is an He 70 from the Condor Legion.*

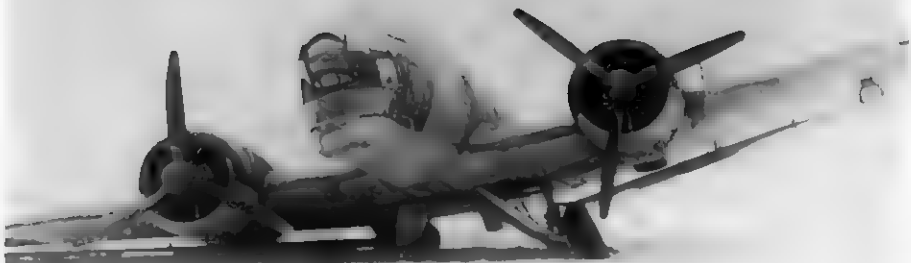




*Above. This Ju 86 E-2 served for a long time as a training aircraft.*

*Below. For security reasons the moveable guns were removed - overnight - from this parked Ju 86 E-2*





*Above: This Ju 86 E-2 belonging to FFS C 16 suffered a mishap in 1940 at an airfield in Bohemia.*



*Left: Gefreiter Haferland stands in front of his machine. Notice the massive BMW 132 radial engine.*



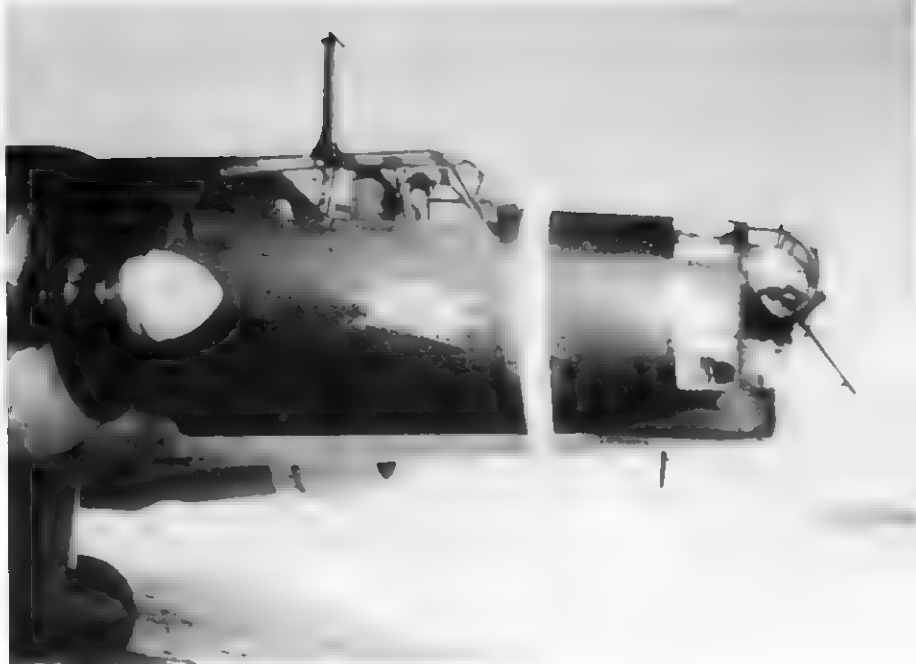
*A rough crash landing, which the crew fortunately survived, at Blindflugschule 3 in Prague-Rusin.*



*Right: A Ju 86 E-2 trainer landing at the Brandis airbase near Leipzig*

*Below. A parked Ju 86 E of FFS C 6 in the summer of 1940.*





*Above: A trainer from Luftnachrichtenschule 1 in the winter of 1939/1940.*

*Below: This Ju 86 E was used by FFS C 2 for high altitude flights.*







*Above: A Ju 86 E on approach to Bindersleben in August 1941*



*Left: A taxiing accident which took place in Prague, only the wing leading edges were slightly damaged.*



*Right: This photo of a crashlanded Ju 86 E-2 was taken in Western France during instrument flying training.*

By 2 September 1939 2195 front-line aircraft were available, of which 1896 were operational

With the exception of 30 Ju 86 G-1s used by IV/KG 1 for conversion training, the Ju 86 could no longer be found in front-line service by the time the war broke out, they had all been assigned to the numerous C-class pilot training schools. At the end of 1942 two Transportgruppen were established, KGzrbV 21 and 22, with a total of 56 Ju 86s for resupplying the Sixth Army which was under siege in Stalingrad. During operations lasting until January 1943 both Gruppen lost a combined total of 42 machines. In March of that year these units were disbanded and the 16 surviving Ju 86s were handed over to the C-class schools

As the war progressed the RLM also reached into its bag of "reserve aircraft". The Aircraft Program (conversion) from 1 December 1943 called for converting large numbers of second hand Ju 86s

At Letov's facilities in Prague 15 machines from repair inventory and Ju 86 Es from operational units were to be fitted with BMW 132 engines and larger fuel tanks for longer range operations. The aircraft had already been given the designation of Ju 86 E-10 based on the changes already directed. However, the contract was only partially filled. Loss reports from the schools and other units indicate several write-offs during training flights with the E-10.

In addition, there were plans for Letov to convert 24 Ju 86 E-6/E-8 bombers pulled from operational units to instrument flight trainers, they were to have been designated Ju 86 E-12/E-13 and be available by the end of October 1943. This contract, too, was only partially filled

In the winter of 1943/44 the Ju 86 was used for ongoing operations against partisan activity in the Balkans.

*Flight Blindflugschule 5 was dedicated to training night fighter crews. This Ju 86 with covered nose gunner's position was parked for a few days in Belgrade-Zemun.*



*Below Ju 86s from the training schools were grouped together to form KGzrbV 21 and 22 in order to resupply besieged Stalingrad*



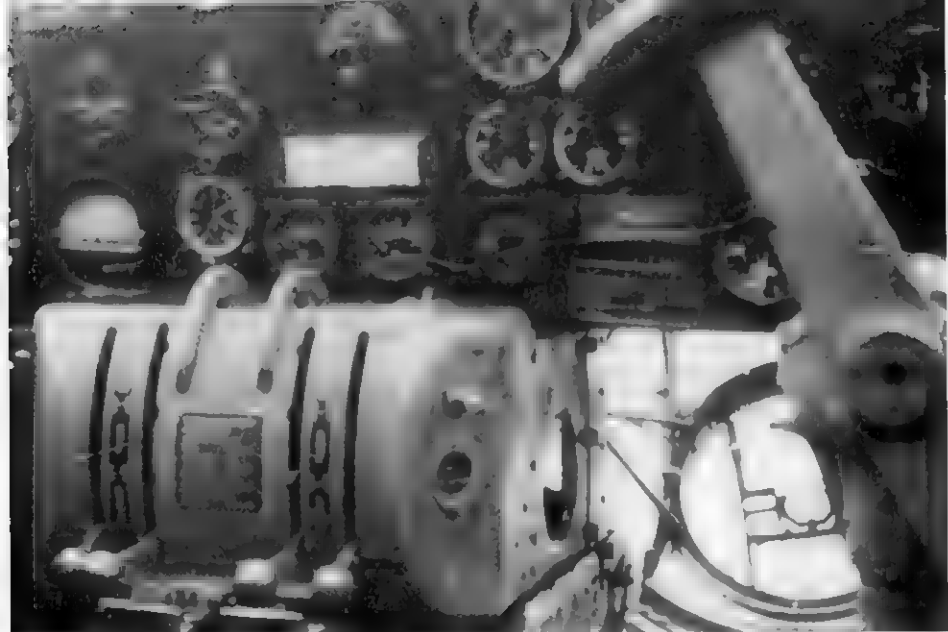
*Right. Engine test following repairs undertaken on this aircraft from FFS C 15 in the autumn of 1940.*



*Above: A crash landing in front of the well-laid out Prague-Rusin airbase, which hosted countless training flights.*

*Below: This machine, which skidded off the icy runway on 12 February 1940, belonged to FFS C 16.*





*Above: Interior shot of the forward Ju 86 G-1 cabin showing its throttle controls.*

*Below: Cockpit details of a Ju 86 G-1. An MG 15 could be fitted into the glazed nose, in which case 600 rounds of ammunition were then carried.*



*Below: Training at the Wels airfield in the winter of 1939/1940*



*Right: The Ju 86 G-1, of which only 40 were built, was used in the aerial communications schools.*



*Left: This Ju 86 G-1 was written off as a result of an unfortunate collision during a landing*



*Right: This photo of a field strip was taken during a deployment exercise; A Ju 86 G-1 and a Ju 52/3m can be seen.*





## The Ju 86 In Foreign Service

From early on, the Ju 86 was planned for the export market. In order to better sell the Ju 86 abroad, the Ju 86 V 4 was fitted with the BMW 132 Dc radial engine in place of the diesel motor. The same thing happened to Ju 86 B-07 (D-ANUV), which was utilized as the demonstration airplane for the hoped-for Ju 86 Z-2 (at Junkers, Z stood for civil export versions and K represented military versions). In addition to the BMW engines, there was also the Bristol Pegasus, Gnôme-Rhône Mistral 9K and the Pratt & Whitney Hornet S1E-G.

On 15 May 1936 a Ju 86 was exhibited at the ILIS Aviation Show in Stockholm. As a result, on 30 June 1936 Sweden—the first foreign interested party—ordered a Ju 86 A-1, which according to Swedish requirements was to be equipped with the P&W Hornet S1E-G radial engines. On 19 December that year the first machine was delivered to Sweden under the designation of Ju 86 A-1k. One month earlier Sweden had ordered two additional Ju 86s. One Ju 86 K-4 destined for Sweden crashed into the Baltic Sea on 18 May 1938 during its delivery flight.

Twenty of the Swedish machines were powered by the Bristol Pegasus III nine-cylinder radial engine, which Sweden began license-building in 1937. Those Ju 86 K-4s with Pegasus III engines were designated by the Swedes as Ju 86 B3A, while those with the more powerful Pegasus XII were designated Ju 86 B3B.

Altogether 40 Ju 86 K-4s and K-5s were supplied, in addition to 16 Ju 86 K-13s license-built as Ju 86 B3B and B3D in Trollhättan, Sweden, beginning on 3 November 1937. The first prototype from

Swedish production was cleared to fly in August of 1939 and was initially powered by Pegasus III engines, although these were later replaced by the more powerful XXIV version.

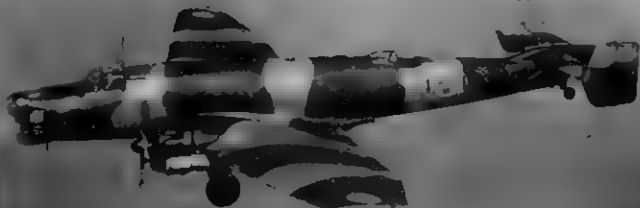
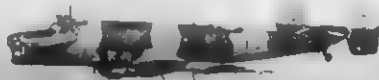
The first civil Ju 86 Z-7 (SE-BAE "Svalan", Werknr. 860959) was delivered by Junkers to the Swedish AB Aerotransport in March of 1938, powered by P&W Hornet S1E-G radial engines. This Z-7 was eventually, in early 1940, taken over by the Swedish Air Force and flew as a bomber with the coding 911.

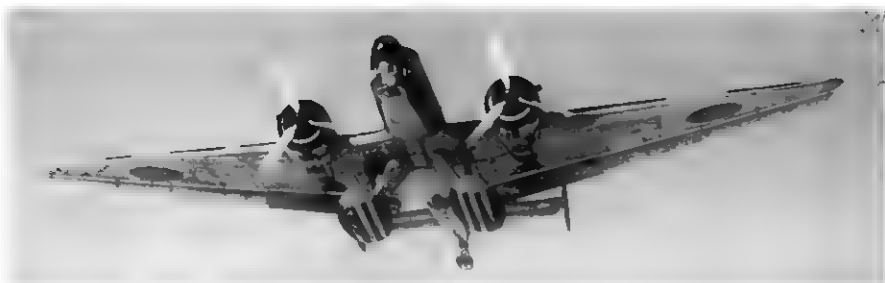
Until 1948 the Ju 86 also operated with the Swedish Air Force as a torpedo bomber, although in small numbers, it was subsequently used as a trainer and transport aircraft until its eventual retirement in 1958.

The Hungarian government issued a contract to Junkers in 1936 for 24 Ju 86 airframes. These aircraft were to be powered by the French Gnôme-Rhône 14k Mistral Major radial engines license built by the company of M. Weiss in Budapest. Due to delays in production the first of 63 Ju 86 K-2s only arrived in Hungary in early 1938 and in the summer of that year were assigned to Hungarian bomber squadrons.

These Ju 86 K-2s (coded B 301, B 302, etc.) served in combat until 1942, but because of severe losses suffered during the war with the Soviet Union were relegated to the training role. Additional Ju 86 K-2s were delivered in 1941 and carried the registration L-101, L-102, etc.; two years later a further five Ju 86s were delivered with the codes T-501 etc., but these were primarily used as transports.

*The Ju 86 K-4, K-5 and K-13 variants were used in the Swedish armed forces.*





*Above: This Ju 86 K with ski-type landing gear was based on a modified A-1. Only three of these aircraft were converted in such a manner for testing purposes.*



*Above: Overland flight of a Ju 86 K-13 above the vast expanse of Sweden's forests.*



*Right: The first Ju 86 K-2 of the Hungarian Air Force after being accepted by its crew.*



*Left: As the fourth Ju 86 K-2 in the Hungarian Air Force, B 304 served for a time with Bomber Regiment 2*



*Right: This Junkers bomber of the Hungarian Air Force belonged to Bomber Unit 2/5, which operated both Do 23s and Ju 86 K-2s.*



*Left: A Ju 86 K-2 which crash-landed in Hungary. It was later repaired and took part in operations in Yugoslavia.*



*Above: This photo was taken in a hangar (probably in Debrecin) and shows the first Hungarian Ju 86 K-2. Notice the extendable belly position.*

*Below: The Hungarian Ju 86s were armed with guns of indigenous design.*

*Below: This Hungarian Ju 86 K-2 belonged to Bomber Unit 3/5 "Hüvelyk Matyi" and is seen here undergoing maintenance in winter conditions.*



Ju 86 B-02 (HB-IXI, Werknr. 860008) was delivered to Switzerland in 1936 with Jumo 205 C 1 engines. This machine crashed near Frankfurt am Main around the end of 1937. As a replacement, Ju 86 B-10 (HB-IXE, Werknr. 860951), also powered by Jumo 205 engines, went to Swissair in February of 1937 as a Ju 86 Z-1. In early 1939 it was refitted with BMW 132 Dc radial engines. The new registration was HB-IXA (Ju 86 Z-2). On 19 July 1939 the airplane crashed near Constance.

For its air force, Chile ordered twelve Ju 86 K-6s on 2 September 1937 as medium bombers, powered by Pratt & Whitney Hornet engines. LAN Chile also ordered three Ju 86 Zs with Jumo 205 diesel engines in 1937. Production of these machines began with Ju 86 (Werknr. 0246, D—AUME, Annaberg), a modified Ju 86 A-1.

In addition to Chile, at least five Ju 86 Z-2s (M-210 to M-214) were assigned to the aviation branch of the South Manchurian Railway in Japanese-controlled Manchuria.

To Portugal went ten Ju 86 K-6s in 1938 for the Grupo de Bombardemento de Dia. The machines were assigned to the two bomber squadrons based in Alverca, which also flew the Ju 52 K as an auxiliary bomber. Because of their equipment configuration it was only possible to employ these bombers in daylight operations. Defensive armament resembled that of the early Ju 86s in the German Luftwaffe.

In Bolivia local Germans founded the Lloyd Aéreo Boliviano (LAB). First flights were made with a Ju F 13 on 24 December 1925. The LAB took over the first of four new Ju 86 Z-7s with P&W Hornet engines (Werknr. 860013, 860234-237 and -240).

*Left: From 1940 the Hungarian Ju 86s became more and more frequently employed for training purposes. The machine shown here was part of the Bomber Unit 3/3 "Sárkány".*



*Below: Swissair operated several Ju 86s. This is the C-1 model HB-IXE in Zürich-Kloten.*





*Right: From the end of 1937 the Ju 86 K-6 served as a medium bomber with the Chilean Air Force*



*Below: Four Ju 86s (M-210 to 214) were used as liaison, transport and communications aircraft in the Japanese-controlled territory of Manchukuo (Manchuria)*



In addition to civilian usage, starting in 1941 missions were flown for the Bolivian Air Force (Fuerza Aérea Boliviana) in which the machines were planned for use as transport aircraft, but were pressed into service armed with machine guns and based for a time in Alto La Paz with the flying group stationed there.

In accordance with the Passau acquisition agreement the Republic of Austria placed an initial order for twelve Ju 86s with Jumo 205 engines, of which only three were actually delivered (Werknr. 0964 to 0966) at a unit price of 250,000 RM. Instead of the original engine arrangement, the contract was changed to delivery of six Ju 86s by Junkers—following approval of Reich officials—with the BMW 132 in December 1937 and a further six in February 1938. It was planned to use the machines to equip two Staffeln of the "Bombergeschwader". Their homebase was to have been the Zeltweg airbase.

The first three aircraft (311 to 313) were flown back to Dessau on 16 February 1938 "due to simultaneous appearance of technical defects". Just one month later, on 12 March 1938, the so-called "Anschluss" of Austria took place.

The pre-production aircraft Ju 86 B-011 (Werknr. 860952) flew with Jumo 205 C engines in February 1937 as Ju 86 Z-1 (registration VH-UYA "Lawrence Hargrave") on a multi-stage flight to Australia. This long-distance trip drew worldwide attention, and it wasn't until August of 1937 that the aircraft returned to Dessau again and was given its original registration of D-AGEY.

The Ju 86 was also flown, sometimes under harsh weather conditions, in the South African Union, which was at that time part of the British Empire. The South African airlines "South African Airways" (SAA) ordered the following 17 civil Ju 86 Z-3 and -7 airplanes.

Type	Registration, Name	Werknr.
Ju 86 Z-3	ZS-AGE Louis Trichardt	unk.
Ju 86 Z-3	ZS-AGF Richard King	unk.
Ju 86 Z-3	ZS-AGG Ryk Tulbagh	unk.
Ju 86 Z-3	ZS-AGH Sir John Cradock	unk.
Ju 86 Z-7	ZS-AJG Gen. David Baird	unk.
Ju 86 Z-7	ZS-AJE Gert Maritz (later Sarel Villiers)	
Ju 86 Z-7	ZS-AJK Hendrik Swellengrebel	unk.
Ju 86 Z-7	ZS-AJL Cecil John Rhodes (later Daniel Lindley)	
Ju 86 Z-7	ZS-ALN Sir Hercules Robinson	unk.
Ju 86 Z-7	ZS-ALV President Steyn	unk.
Ju 86 Z-7	ZS-ANA Sir J. Gordon Sprigg	862017
Ju 86 Z-7	ZS-ANB Hendrik Potgieter	862018
Ju 86 Z-7	ZS-ANC Sir Benjamin D'urban	862019
Ju 86 Z-7	ZS-AND Lord Charles Somerset	862020
Ju 86 Z-7	ZS-ANE Simo von der Stel	862021
Ju 86 Z-7	ZS-ANF Jan van Riebeeck	862022
Ju 86 K-1	ZS-ANI	862041

The first five Ju 86 aircraft were to be delivered at the end of 1936 with Rolls-Royce Kestrel engines as Ju 86 Z-1s. However, the SAA expressed concerns over the general suitability of these engines and Junkers eventually decided to re-engine those aircraft planned for Africa (Ju 86 Z-3) with the proven P&W Hornet radials. Accordingly, the remaining aircraft on the contract were converted over to this powerplant and given the designation of Ju 86 Z-7. Deliveries of the first production aircraft to the SAA began in June of 1937.



The Ju 86 K was only used by the Austrian Luftstreitkräfte for a short period of time.

The South African Air Force (SAAF) only bought a single Ju 86 K-1 military variant for evaluation purposes. The aircraft was successfully demonstrated on 31 January 1938 in South Africa by the famous Junkers pilot, Robert Untucht. Barely a year later, on 20 and 30 September 1939, two of the Ju 86s delivered to the SAA crashed in the vicinity of Johannesburg.

In 1939 the SAAF assumed control of all remaining Ju 86 Z-3s and Z-7s of the SAA. Some of these machines were fitted with 0.303 Vickers machine guns in their dorsal position. Unlike the Ju 86 K-1 of the SAAF, the bomb racks were located externally under the fuselage center section.

With the outbreak of the Second World War the Ju 86s in South Africa were given the numbers 641 to 658. These included ten machines and their crew from SAA, which were formed into

an "Airways Wing". Three served with No. 16 Sqn. in Walvis Bay as coastal patrol aircraft and in December of 1939 flushed out the German blockade runner "Watussi". Beginning in May of 1940 ten Junkers aircraft served with No. 12 Sqn., operating against Italian ground forces in what was then Abyssinia and Somalia. One of these Ju 86s was shot down on 3 September 1940. On 1 May 1941 the remaining Ju 86s were assigned to the newly-established No. 18 Sqn. in Addis Ababa. These aircraft remained in service there until August of that year. No. 22 Torpedo Bomber Sqn. in Durban was given a few of these machines in July 1942.

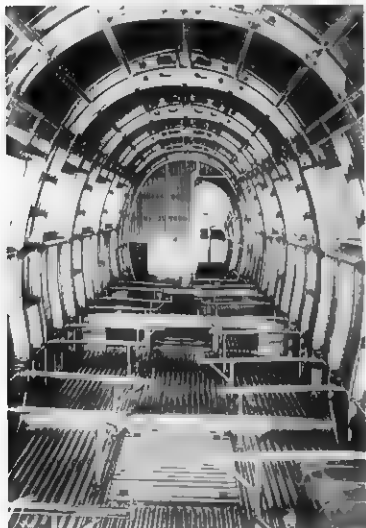
Of the Ju 86s in South African service, ten were lost due to crashes, one to enemy action and three served as hacks. With the exception of one Ju 86, all remaining aircraft were turned over to No. 69 Air School for training purposes. These planes served until 1947, when they fell victim to the cutting torch.



*The crew of D-AKOP flew all the way to Australia, which was a major success for the Junkers Werke.*



*Above: These three Ju 86s could be seen in various paint schemes between December 1937 and February 1938.*



*Left: A Ju 86 C-1 before being fitted out with interior accoutrements for a passenger airliner.*

*Below: Ju 86 machines before their delivery to South Africa.*



## Civil Versions of the Ju 86

The primary role of the Ju 86 was and remained a three-seat bomber with diesel engines, but it also found a secondary role "equipped as a commercial airliner". Initially, the airliner also had the option of rapidly being converted back to a bomber with minimal difficulty.

Like with the Do 17 or He 111, there is the prevalent story that the commercial airliner was made into a medium bomber to meet the needs for rearming the Luftwaffe. However, recent information has come to light which shows that there is no basis for these claims.

On 22 March 1934 the Ju 86 V 2 (Werknr 4902, D-ABUK) completed its maiden flight as the prototype for a passenger airliner. The test flight program began in April of 1935. Aside from the lack of armament the airliner differed from the military variant primarily in having the fuel stored in a main fuselage tank with a capacity of 920 liters and four wing tanks (two each of 320 and 240 liters). This permitted room for three crew members and ten passengers in the 1.34 meter wide cabin. The machine was handed over to the DLH in June of 1936. The second civil prototype (Werknr 4904, D-AREV) also went to the Deutsche Lufthansa that same month. Ju 86 V 2 carried the name "Dresden" before DLH management decided to give all their Ju 86s the names of prominent German mountains. After that the airliner was christened "Brocken".

In December of 1936 both prototypes were returned to the Junkers Werke. Ju 86 V 4 formed the basis for the B-series, being re-engined with two BMW 132 Dc radial engines, and was handed back over to the DLH in June 1937. On 18 June 1937 the aircraft crashed near Hamburg as a result of pilot error.

The use of the BMW engine by DLH was a double-edged sword. The Jumo engine needed just 70 liters of diesel for every 100 air kilometers, while the BMW engine required 100 liters over the same distance. On the other hand, the boost in speed lay between 30 and 70 km/h.

For cost reasons, Lufthansa generally preferred those versions with diesel engines. Accordingly, the DLH's Ju 86 purchases from June 1936 onward ran as follows:

Date	Buy	Allocation	Inventory	Comments
12/31/1936	5	1	6	—
12/31/1937	7	-	12	plus insurance
12/31/1938	-	-	12	—
12/31/1939	1	-	13	—
12/31/1940	-	-	1	12 Ju 86s transferred to the Reich as "a special effort of Lufthansa due to the war situation"
12/31/1941	-	-	0	1 aircraft given to RLM

The Ju 86 V 4 during flight testing. The airplane in the background is a four-engined Ju G 38.







*Above. The Ju 86 V 4 was given a thorough checkup by the Deutsche Lufthansa on its scheduled flight routes*

*Below Ju 86 B-0 "Kismet" took part in the "Oasis Flight" in Egypt prior to the war.*



On 30 June 1944 eight machines were made available to the DLH for its routes. These were not, however, the property of Lufthansa, but had been chartered from the Luftwaffe's inventory for the sole purpose of maintaining civilian flight routes. In detail, between 1937 and 1940 the following Ju 86 aircraft were operated by Lufthansa.

In use from:	Werknr.	Registration	Name	Comments
1935	4902	D-ABUK	—	Ju 86 V2 w/ Jumo 205 C
1936	4904	D-AREV	Dresden	Ju 86 V4 w/ Jumo 205 C
			Brocken	later, prototype for Ju 86 B w/ BMW 132 D
	860007	D-AXEQ	Bückeberg	Ju 86 B-01 w/ Jumo 205 C, 1936, w/o win- dows, long- range flight from Dessau to Bath- urst
	860009	D-AHYP	Schneekoppe	Ju 86 B-03 w/ Jumo 205 C
	860010	D-ALÖZ	Zugspritz	Ju 86 B-04 w/ Jumo 205 C
	860011	D-AQER	Inselberg	Ju 86 B-05 w/ Jumo 205 C
	860012	D-AZAH	Feldberg	Ju 86 B-06 w/ Jumo 205 C
	860014	D-AFAF	Watzmann	Ju 86 B-09, re- fitted with BMW 132 Dc
1937	860016	D-ANUV	Wasserkuppe	Ju 86 B-07, re- fitted with BMW 132 Dc as ex- port Z-7
	860972	D-AKÖI	Kaiserstuhl	Ju 86 C-1 w/ Jumo 205 C
	860973	D-AQEA	Schauinsland	Ju 86 C-1 w/ Jumo 205 C

*Ju 86 B-01 (D-AXEQ) served as a testbed for engine evaluation.*

860974	D-ASOE	Hesselberg	Ju 86 C-1 w/ Jumo 205 C
860975	D-AVOE	Obersalzberg	Ju 86 C-1 w/ Jumo 205 C
860976	D-AMYO	Melibokus	Ju 86 C-1 w/ Jumo 205 C
	D-AJEQ		
860977	D-AJUJ	Vogelsberg	Ju 86 C-1 w/ Jumo 205 C
860246	D-AUME	Annaberg	Ju 86 A-1, BMW 132 Dc, proto- type for Z-se- ries, V 24
860502	D-ADJO	Hohentwiel	previously planned for Manchukuo (Ja- pan)

Because of its relatively short range the Ju 86 was used by Deutsche Lufthansa mainly for inland flight routes. The following were used on the internal route network: Berlin, Bremen, Breslau, Dortmund, Gleiwitz, Hannover, Köln and Leipzig.

However, with the appropriate equipment the Ju 86 machines were fully capable of logging long range flights. An example of this was on 22 August 1936 when Ju 86 B-01 (D-AXEQ, called "Bückeberg") completed the 5,800 km distance from Dessau and Bathurst (West Africa) in an 18.5 hr non-stop flight. The aircraft was fitted with a large auxiliary tank in the fuselage, necessitating an increase in the takeoff weight by 2100 kg.

A Ju 86 B-0 (D-AKOP "Kismet") was the victor in the 3rd International Flying Meet of the Aero Club of Egypt in Cairo (22-26 February 1937), safely returning to the Egyptian capital after taking part in the "Oasis Flight" via Luxor and a handful of remote oases in the Sahara.

Another highpoint was the flight of Ju 86 Z "Lawrence Hargrave" to Australia. This was a distance of 23,335 kilometers, completed in an actual flight time of 69 hours.

Long-distance flights were also carried out by those high altitude aircraft derived from the Ju 86 G.





*Left: The first Ju 86 C-1 (Werknr. 0246) was the first version of the Z-series export variant. The machine was flown for a time as a transport with the Luftwaffe as WL-AJUU.*

*Right: This Ju 86 C-1 also flew with the Luftwaffe as a transport.*



*Below: The fourth Ju 86 prototype carried the Werknummer 4904 (D-AREV).*





*Above: This photo of a Ju 86 was taken at the Hamburg-Fuhlsbüttel, the Ju 86 served on 18 of DLH's routes.*

*Below: Ju 86 B-05 (D-AQER, "Inselberg") on approach in Berlin.*



## The Ju 86 P and R High-Altitude Variants

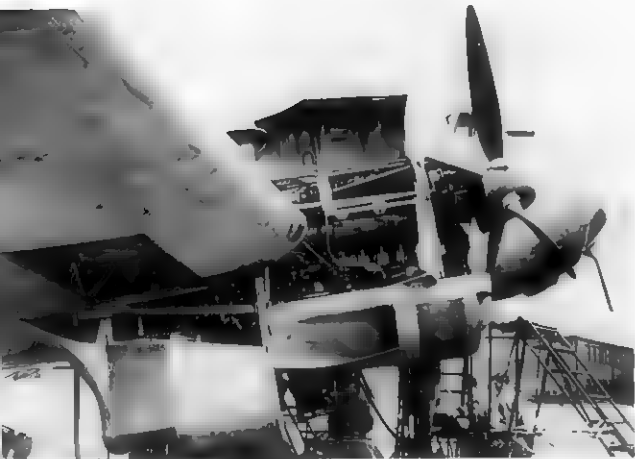
Following the construction of the "specialized photography aircraft", the Ju 86 V 9, and its successful use as a photo platform from the end of 1936 on, in September of 1939 the RLM awarded Junkers a contract for producing 40 Ju 86 high-altitude aircraft as quickly as possible. Junkers' rich experience with long years of developing high-altitude aircraft (Ju 49 and EF 61) was accordingly put to good use. Junkers took the fuselage of the Ju 86 G for the future high-altitude version, replacing the entire glazed nose section from the second prototype on with a pressurized high-altitude cabin. By November of 1939 basic construction had virtually been completed, immediately followed by the fitting of component systems. At the same time engine tests were undertaken using the planned Jumo 207 powerplants. Just a short time later Junkers test pilots Heintz and Seibert carried out the first flight with the Ju 86 PV 1 (D-AHUB). There followed two additional test prototypes in February and March of 1940, fitted with pressurized cabins and Jumo 207 A-1 six-cylinder diesel inline engines. The third prototype (Ju 86 PV 3) was the first machine to be fitted with the lengthened wings of 25.60 m span. Additional improvements enabled the aircraft to achieve a ceiling of 13,000 meters.

Initially, the Ju 86 P-series carried no defensive armament, but later the aircraft were fitted with a MG 17 (called a "Spitfire") in its tail. These high-altitude planes also had modified ordnance release and fuel systems. Four bomb bays in the Ju 86 P-1 and R-2 served to carry 16 ZC/SC 50 or four SC 250 general purpose bombs. Located behind the bomb bays were two fuselage tanks having 1,290 liter and 1,130 liter capacities as well as two 152 liter lubricant tanks and a 60 liter coolant reservoir. The radio communications system consisted of an FuG X radio; in addition, a PeilG

V was fitted for navigation. Two FuBl 1 ILS systems were also carried. By August of 1940 43 high-altitude flights of over 10,000 meters were carried out with the prototypes, including a first high-altitude night flight.

In the summer of 1940 Junkers delivered the first Ju 86 P to Aufkl. Grp. Ob.d.L. for conducting reconnaissance missions over England. Additional reconnaissance flights were carried out over the former USSR from bases in Poland and Romania prior to the beginning of Operation Barbarossa. Only eight of the conversion production variants had been completed by early December 1940 due to the lack of engines. Testing continued until the spring of 1941 at the Rechlin test facility. Only a few months later, in September of 1941, work began on a further development of the Ju 86 P designated the Ju 86 R-1. This variant was powered by the more powerful Jumo 207 B-3 diesel engines driving four-blade propellers. Work also began on rapidly improving the performance of the design, resulting in the Ju 86 P-3. The first Ju 86 R (Werknr 0421) was delivered in November 1941 and, with four others produced by April of 1942, assigned to Kommando Rowehl for operational flights.

In addition to Kommando Rowehl, the Ju 86 P also served in other units. One example was Aufklärungsgruppe 33, whose 2(F) Staffel deployed with a handful of Ju 86 P-2s to Kastelli on Crete in the spring of 1942. Several missions over Egypt and North Africa were carried out from this base. Up until 24 August 1942 the reconnaissance planes were able to operate unchallenged. On that day, however, a Spitfire Mk V succeeded in shooting down a Ju 86 P-2 over Cairo from an altitude of 12,000 meters. A few days later two additional Ju 86 Ps were lost over Aboukir due to enemy action.



Numerous defects in the high-altitude engines of the early Ju 86 P prototypes became apparent during the testing stage of the powerplants.

In September of 1942 Spitfires were also able to reach the Ju 86 P-2s flying recon missions over England, although they did not succeed in shooting any down. Because of these occurrences the Luftwaffe Command stopped further daytime flights by these high-altitude aircraft.

In the meantime, the Junkers Werke focused all its efforts on developing a more capable high-altitude reconnaissance platform, the P-3 variant, to which a few machines from the Ju 86 R-1 series were converted. The GL C/E 2d department for contractual supervision assigned the high production prioritization category "S" to the Ju 86 R-1 high-altitude reconnaissance aircraft, effective 15 March 1942 under Auftr./Erpr. Nr. 1875. This literally stated:

"Testing underway. Increase in altitude achieved by enlarging the impeller. Further increase is being worked on by GM 1 Einbau (Fitting)."

The importance placed on developing the Ju 86 R-1 is revealed in the following memorandum from Rechlin:

"Rechlin E3 a1 Dia/Tz Auftragsübersicht 15.03.42 Erpr. Nr. Dringlichkeit 2588 I

Jumo 207 B-3/V in a Ju 86 R-1

Ju 86 R-1/0421 was delivered in mid-January and static testing carried out. By making changes the minimum temperature for starting engines without auxiliary power assistance was dropped to 12 degrees. Startup tests are planned for the cold chamber. Engines (Jumo 207) numbers I and II were fitted with enlarged supercharger inlets. Comparison flights showed an increase in the maximum ceiling. The airframe will subsequently be handed over to GM 1 for testing."

The improved Ju 86 R, with increased wingspan (32.0 m), improved high-altitude Jumo 207 B-3/V engine with modified intakes and four-blade all-metal VDM propellers, became available in the summer of 1942. Since the performance of the enemy fighters was constantly improving as well and any further increase in the Ju 86's performance would only be possible at great expense, contracts for the Ju 86 R-1 and R-2 were cut back on a massive scale.

The designers at Junkers hoped to increase performance further by installing the Jumo 208 or the Jumo 207 D and E engines. However, these powerplants were fitted on a trial basis only. Nor was it possible to fit the Ju 86 R-3 with a DB 605 T-0 turbo-supercharged engine, since the fuselage cross section of the Ju 86 was too small.

## HIGH ALTITUDE VARIANT OVERVIEW

Ju 86 PV 1	high-altitude aircraft, two-seat, 2x Jumo 207 A-1, testbed for high-altitude pressurized cabin and engines, wingspan 22.5 meters
Ju 86 PV 2	high-altitude aircraft, prototype same as Ju 86 V 1 but with pressurized cabin
Ju 86 PV 3	high-altitude aircraft, same as V 1 and V 2 with a wingspan of 25.6 meters
Ju 86 V 28	testbeds for Ju 86 P-1 high-altitude bomber
Ju 86 V 30	
Ju 86 P-1	high-altitude bomber, similar to V 3 with four bomb bays
Ju 86 P-2	high-altitude strategic reconnaissance aircraft, similar to P-1, but with three cameras and modified fuel tanks in place of bomb equipment
Ju 86 P-3	high-altitude aircraft, layout not documented
Ju 86 V 29	high-altitude reconnaissance aircraft, two-seat, 2x
Jumo 207 B-3,	wingspan 32.0 meters, otherwise similar to P-series
Ju 86 R-1	high-altitude reconnaissance aircraft, like V 29 with two cameras
Ju 86 R-2	high-altitude bomber, like P-1 with Jumo 207 B-2 and a wingspan of 32.0 meters
Ju 86 R-3	high-altitude bomber, 2x Jumo 207 B and a central turbocharged DB 605 T-0, planned ceiling of 17 km, not built

Note the cabin details and radio antennae on this Ju 86 G-1 parked in Dessau.



Ju 186 high-altitude bomber, four-seat, 4x Jumo 208, increased wingspan, remained on drawing board  
 Ju 286 high-altitude bomber, 6x Jumo 208, remained on drawing board

The total number of Ju 86s built remains disputed in aviation literature. In the *Junkers-Nachrichten*, Vol. 2 from April 1962, the following Ju 86 production figures were cited: developmental aircraft - 5, production - 543, license-built - 292 airframes. By 1939 a rather significant portion of the production run, by and by, was

converted over to a wide variety of trainers, these subsequently appeared with their new designations in the inventory lists of schools and other units. The same thing also applied to those airframes converted to the P- and R-series high-altitude bombers and reconnaissance aircraft, of which around 50 machines were rebuilt between 1939 and 1943.

Based on this information, it can be assumed that the total production number lies somewhere between 850 and 950 Ju 86 aircraft in all variants, including those aircraft which were license-built.

*Right: Fitting the two-place pressurized cabin onto a former Ju 86 G-1 airframe in Dessau.*



*Left: The remarkably compact pressurized cabin for the Ju 86 P and R was not fitted with weapons and provided adequate space for the pilot and radio operator.*



*In developing the Ju 86 high-altitude aircraft, Junkers was able to draw upon its experience with the construction of the Ju EF 61 prototype which flew in 1937*







*Left: Deployment flight of a Ju 86 P-1 to Crete.*

*Right: Numerous reconnaissance missions were flown from Crete over the eastern Mediterranean Sea. The first Ju 86 P was shot down over Egypt by a Spitfire Mk V on 28 August 1942*

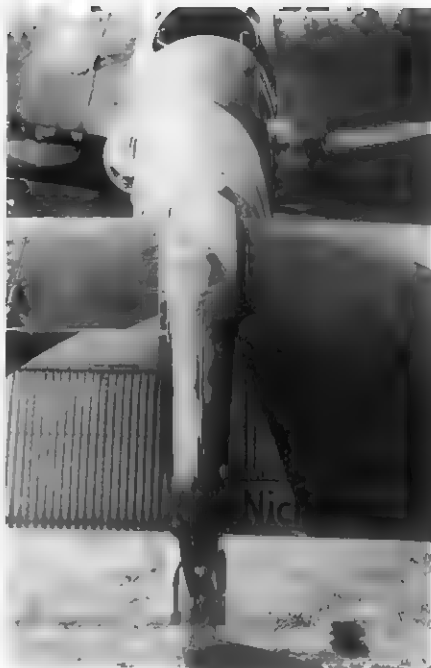


*Below: The Ju 86 R was the successor to the Ju 86 P-series. It was able to operate at a somewhat higher altitude than the Ju 86 P thanks to an improved powerplant system and four-blade propellers*





*At least one Ju 86 D was used for testing remote-controlled guns, necessary for arming high-altitude combat aircraft and bombers. The two sighting cupoles bear a strong resemblance to those used on the Ju 288 prototypes.*



# JU 86 TECHNICAL DATA

Type	Ju 86 B	Type	Ju 86 Z-2
design	cantilever low-wing	design	cantilever low-wing
role	personnel and mail carrier	role	personnel and mail carrier
crew	2 pilots and 1 radioman	crew	2 pilots and 1 radioman
passengers	10	passengers	10
engine	2 Jumo 205 C with 600 hp each	engine	2 BMW 132 Dc with 845 hp each
wingspan	22.50 m	wingspan	22.50 m
length	17.60 m	length	17.60 m
wing area	82.00 m <sup>2</sup>	wing area	82.00 m <sup>2</sup>
wheel track 3.00 m		wheel track 3.00 m	
weight(empty)	5200 kg	weight(empty)	5200 kg
weight(equipped)	5790 kg	weight(equipped)	5900 kg
load	2060 kg	load	2300 kg
max. all-up weight	7850 kg	max. all-up weight	8200 kg
passenger area	10.20 m <sup>3</sup>	passenger area	10.20 m <sup>3</sup>
storage area	3.50 m <sup>3</sup>	storage area	3.50 m <sup>3</sup>
endurance	5.3 hrs	endurance	3.3 hrs
range	1500 km	range	1000 km
max. range	2500 km	max. range	1500 km
fuel consumption	70 l/100 km	fuel consumption	100 l/100 km
oil consumption	4.5 l/100 km	oil consumption	6.5 l/100 km
max. speed	310 km/h	max. speed	375 km/h
cruising speed	280 km/h	cruising speed	315 km/h
landing speed	98 km/h	landing speed	101 km/h
takeoff run	335 m	takeoff run	290 m
landing run	260 m	landing run	285 m
max. ceiling	5900 m	max. ceiling	6900 m
time-to-climb 1000 m	4.0 min.	time-to-climb 1000 m	3.1 min.
time-to-climb 2000 m	8.8 min.	time-to-climb 2000 m	6.0 min.
time-to-climb 3000 m	15.0 min.	time-to-climb 3000 m	9.1 min.
climb rate at low alt.	4.2 m/s	climb rate at low alt.	5.2 m/s



Ju 86 C-1 (D-AVOE, "Obersalzberg") could be seen on many of the Deutsche Lufthansa's flight routes.

Type	Ju 86 P-1
design	cantilever low-wing
role	high-altitude reconnaissance aircraft
crew	2
engine	2 Jumo 207 A-1
wingspan	25.60 m
length	16.46 m
height	4.70 m
wing area	92.00 m <sup>2</sup>
wheel track	3.00 m
weight(empty)	7160 kg
weight(equipped)	8120 kg
load	3200 kg
max. all-up weight	11500 kg
endurance	6.5 hrs
range	1000 km
max. range	1800 km
fuel consumption	315 l/hr
max. speed at 0 meters	310 km/h
max. speed at 12000 meters	400 km/h
cruising speed	240 km/h
takeoff run	610 m
landing run	700 m
max. ceiling	13800 m
time-to-climb 10000 m	54.0 min.
armament	none
radio equipment	FuG X, PeilV, 2x FuBI, K4 U
equipment	4 bomb bays (P-1) 3 cameras (P-2)

## Type Ju 86 R-1

design	cantilever low-wing
role	high-altitude bomber
crew	2
engine	2 Jumo 207 B-3/V each with 880 hp
wingspan	32.00 m
length	16.46 m
height	4.70 m
wing area	97.50 m <sup>2</sup>
wheel track	3.00 m
weight(empty)	—
weight(equipped)	7000 kg
load	2200 kg
max. all-up weight	9500 kg
endurance	7.0 hrs
range	1200 km
max. range	1600 km
fuel consumption	—
max. speed at 0 meters	320 km/h
max. speed at 9000 meters	420 km/h
cruising speed	250 km/h
takeoff run	610 m
landing run	700 m
max. ceiling	14000 m
time-to-climb 13700 m	60.0 min.
armament	1 MG 17 1000 kg bombs
equipment	4 bomb bays



Above: Entry into the pressurized cockpit could only be accomplished by means of a ladder.



Right: An exceptionally large radiator air scoop was necessary for the Jumo 207 to operate at high altitudes.



*This parked Ju 86 G-1 belonged to an instrument flying school, indicated by the warning bands on the vertical stabilizer.*





*Tank killers preparing for a mission on the Eastern Front. (Reitinger)*





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